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In this issue

The Culturally Deprived Child: A New View
FRANK REISSMAN

Research on the Context of Instructional Television
JOHN L. HAYMAN, JR., AND JAMES T. JOHNSON, JR.

APRIL 1963

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Commissioner Keppel says—

Education has long served research; now let research serve education.

EDUCATIONAL RESEARCH may not be as dramatic as medical research. It may not be directly responsible for saving the life of the individual student; but it is responsible for helping devise the kind of education, the kind of society, that makes life worth living. . . . Your profession—and every other profession—owes its progress to the quality of educational background on which it is able to build. . . . But while education has long served other professions as a tool in their research and development, educators have been far too slow to serve their own field through systematic research and use of the findings. Having come to recognize the need for an educational renaissance, we are now in a position to fight against apathy and ignorance with all the vigor society can muster.

Educational reforms and improvements move slowly, even under the best of circumstances. However, in the past 10 years, more time, talent, and money than ever before in history have been invested in pushing outward the frontiers of educational knowledge. In the next decade or two, we can expect even more significant developments. The basic issue is not whether our students and our schools are *better* than those of a generation ago but whether the quality of today's education is sufficient to meet tomorrow's demands, which will be infinitely more complex than those of the past or present. It is not a matter of whether, through research, we can prove that our schools are better, but whether, through research and implementation, we can make them good enough.

From an address at George Washington University School of Medicine, Institute on "Appraisal of Teaching Techniques with Application to Medical Education," on April 12, 1963.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • ANTHONY J. CELEBREZZE, *Secretary*
OFFICE OF EDUCATION . . . FRANCIS KEPPEL, *Commissioner*
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Notes on the Notable

FEDERAL PROGRAMS AND ACTIVITIES

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Library data-flow project

STATES ARE RECEIVING information about their libraries through a cooperative data-flow project with the Office of Education's Library Services Branch. To compile national statistics about all kinds of libraries, the Branch sends out questionnaires to libraries through State library agencies. The State education or library agencies receive the replies, check them for accuracy, and forward them to the Office. When the replies have been tabulated by IBM, the Library Services Branch sends each State a set of cards on its libraries. Since the Office compiles only national statistics, the use a State makes of the information received through the data-flow project is not a duplication.

Some State agencies are using funds authorized by the National Defense Education Act (title X, sec. 1009) to process and tabulate the data supplied by the Office of Education or to finance surveys they have originated themselves.

To coordinate State and national library statistics, two Office of Education specialists (Ivan N. Seibert, acting director of the Educational Statistics Field Programs Branch, and Frank L. Schick, assistant director of the Library Services Branch) have held meetings in 12 States, under the auspices of State library agencies, with representatives of academic, school, public, and special libraries, the research staffs of State education agencies, and faculty members of library schools. These meetings have been held to—

1. Inform librarians about current and planned Office of Education surveys.

2. Determine the research and statistical needs of librarians in the States.

3. Make Office of Education surveys as responsive to the needs of library agencies as possible.

4. Indicate that the use of funds and equipment for processing of library data is permissible but not mandatory under the National Defense Education Act.

5. Arrange for State and Federal agencies to share data to reduce the number of questionnaires sent to librarians.

6. Assist State agencies in converting manual statistical operations to machine.

7. Work toward the establishment of reliable, comparable, and uniform data for the use of Federal and State agencies and professional groups, associations, and organizations which need statistical information but are unable to collect data on their own.

New library service specialists

TWO NEW PROFESSIONAL positions have been added to the staff of the Library Services Branch of the Division of Cultural and Continuing Education: Public library specialist for adult services and library education specialist.

The specialist for adult education will assess library services to adults; advise librarians in State and public library agencies and organizations on the development and extension of public library services to adults, especially for the aging and the handicapped; and maintain contacts with professional organizations in adult education, aging, reading improvement, and related fields.

The specialist for library education will collect information on curriculums, faculty, and students in library schools; analyze the need for trained librarians in elementary and secondary schools, academic institutions, and public and special libraries; and assist and advise library school directors, administrators of institutions of higher education, State and local librarians, and professional associations and organizations on the problems, development, and practices in library training.

Dorothy A. Kittle, formerly adult services consultant of the North Carolina State Library, has been appointed to the position of specialist for adult services; Sarah Rebecca Reed, formerly executive secretary of the Library Education Division of the American Library Association, to the position of library education specialist.

New language and area centers

THROUGH GRANTS from the Language Development Program of the National Defense Education Act, Columbia University and Duke University will receive support for an additional language and area center during the 1963–64 academic year. Columbia will establish an African Language and Area Center for instruction in Swahili and Hausa and graduate courses in African area studies. Duke, in cooperation with the University of North Carolina, will establish a center for South Asian studies through expansion of the South Asian studies program established as part of its Commonwealth Studies Center. The new center will offer instruction in Hindu-Urdu and Sanskrit in cooperation with the University of North Carolina. The curriculum at the center will include courses in the history, culture, and political science of India, Pakistan, and other countries in which Urdu and Hindi are spoken.

Adult college program

MANY AN ADULT hesitates to go to college because he thinks he will be out of place among teenage students. But through new programs which two divisions of the Office of Education are helping to develop, even a grandfather will feel at ease as a student.

President Kennedy presents plaque to the teacher of the year. On April 22 President John F. Kennedy presented the 1963 National Teacher of the Year Award to Elmon Ousley, a teacher of American government and speech and a teacher trainer at Bellevue (Wash.) Senior High School. The ceremony was attended by (left to right) Edgar Fuller, executive secretary, Council of Chief State School Officers; President Kennedy; Mrs. Louis Bruno; Louis Bruno, Washington State Superintendent of Public Instruction; Mrs. Ousley (also a teacher); Mr. Ousley; William B. Arthur, vice president and managing editor of LOOK Magazine; and Francis Keppel, U.S. Commissioner of Education. The award is sponsored by the Council, LOOK Magazine, and the Office of Education as a recognition of the importance of good teaching.

Representatives of the Divisions of Continuing and Cultural Education and Higher Education have attended many meetings with representatives of some 40 different universities, the Department of Defense, the Civil Service Commission, the Department of Labor, and the Center for the Study of Liberal Education for Adults to help coordinate new degree programs for adults. The first meeting was held in the Office of Education; the most recent at the Air University, Maxwell Air Force Base.

The programs will be innovative. They may not provide for any formal classes or resident requirements. They will stress individual study and "self-education." Credit hours will not control the program; instead, credits will be determined on the basis of examinations, seminars, counseling, and individual study. The programs will be offered by special departments or colleges, who will award their own degrees.

Several universities, notably the University of Oklahoma, Brooklyn College, and Syracuse University, have developed curriculums for their programs. Most types of instruction will be used, including television, audiovisual, correspondence, and seminar.

Housewives, businessmen, military men, and other adults—even some with degrees who want to become "educated"—are enrolling.

Graduate course offered for teachers of the blind

THE FIRST GRADUATE COURSE leading to a master's degree for home teachers of the adult blind will be offered at Western Michigan University in academic year 1963–64. The 2-year course is being added to the university's program through a grant from the Vocational Rehabilitation Administration of the U.S. Department of Health, Education, and Welfare.

The curriculum for the course will draw from special education, social sciences, social work, educational psychology, home economics, and community resources.

Applications should be made to the Director, Program for Training Home Teachers for the Blind, Western Michigan University, Kalamazoo, Mich.

The program is one result of the nationwide survey of home teaching of the adult blind completed in 1960. The American Association of Workers for the Blind and the VRA sponsored the survey to study the problems of blind people in their homes and to discover the essential elements of professional training required to prepare home teachers to meet these problems.

Textbooks for Latin America

MORE THAN 800,000 first- and second-grade public school children in five Central American countries are receiving readers for the 1963 school year from the United States under the Alliance for Progress. The readers are the first in a series of Spanish-language textbooks which are being developed under a 5-year plan which will eventually cover all subjects taught from grade 1 through grade 6.

Books USA

HOW TO MEET the hunger of the people of the world for reading material is one of the largest problems the U.S. Information Agency has. Each year the requests for books that it receives reach the millions. How can such requests be met?

One answer, the Agency believes, is its Books USA program. Through the cooperation of five U.S. publishers of paperbound books and the U.S. public, the Agency is sending overseas packets of 10 or more selected paperbound books on literature, history, science, or economics. The publishers are making the books available at cost ($4), the U.S. public is "purchasing" the packets, and the U.S. Information Agency is shipping and distributing them overseas. The recipient receives a message and a card to return to the purchaser.

Many more purchasers are needed. To take part in the program, order packets from Books USA, P.O. Box 1960, Washington, D.C., for $4 each. The May issue of *Higher Education* lists the contents of the several packets.

FRANK REISSMAN

The culturally deprived child: A new view

AFTER appraising a good deal of the recent work on the education of disadvantaged children, I feel that there is considerable agreement on many recommendations for dealing with the problem. What is missing, however, is a theoretic rationale to give meaning and direction to the suggestions for action. I should like to attempt to provide the beginning of such a rationale.

I think that a theoretic approach has to be based on the culture of the lower socioeconomic groups, particularly on the elements of strength, the positives, in their culture. The terms "deprived," "handicapped," "underprivileged," and "disadvantaged" unfortunately emphasize environmental limitations and ignore the positive efforts of persons in low-income groups to cope with their environment.

Most approaches to the education of the disadvantaged child either overlook the positive features in the culture of low socioeconomic groups or merely mention that there are positive features from which middle-class groups might learn. But they do not spell out what these features are, and they build educational programs almost entirely around weaknesses or deficits. I want to call attention to certain positive features in the culture and psychology of individuals in low-income groups, particularly to their cognitive style, their mental style or way of thinking. One major feature of this style is slowness.

Slow vs dull

Most disadvantaged children are relatively slow in performing intellectual tasks. This slowness is an important feature of their mental style, and it needs to be carefully evaluated. In considering the question of slowness, we would do well to recognize that we probably put far too much emphasis on speed. We reward speed. We think of the fast child as the smart child and the slow child as the dull child. I think this is a false idea. I think there is much weakness in speed and much strength in slowness.

The teacher can be motivated to develop techniques for rewarding slow pupils if she understands the positive attributes of a slow style of learning. She should know that a pupil may be slow because he is extremely careful, meticulous, or cautious; because he usually refuses to generalize; or because he cannot understand an idea unless he does something physically—for example, with his hands—in connection with the idea he is trying to grasp. The disadvantaged child is typically a physical learner, and the physical learner is generally a slow learner. Incidentally the physical style of learning has many positive features hitherto overlooked.

A child may be slow because he learns in a one-track way; that is, he persists in one line of thought and is not flexible or broad. He does not easily shift from one frame of reference to another, and consequently may appear slow and dull.

Analysis of the many reasons for slowness indicates that it should not be equated with stupidity. In fact there is no reason to assume that there are not many slow gifted children. We must begin to search for excellence among the slow learners as well as among the fast.

My own understanding of some of the merits of the slow style came through teaching at Bard College, where I got to know about 40 students quite well over a period of 4 years. They were not the bright students typically selected by colleges, but in some fields they did creative work too outstanding to be ignored. Most of them needed 5 or 6 years to complete college; some had failed courses and made them up in summer; some had dropped out for a while and taken courses in night school.

Such students are slow learners, some of them one-track learners, but very persistent when they get interested in something. They fear being overpowered by teachers whose point of view they cannot accept, and they stick to their own way of seeing a problem. They do not catch on quickly and often fail subjects. Now when there is talk of reducing the 4-year college to 3 years I would submit that many potentially excellent students need 5 or 6 years to complete a college education.

The assumption that the slow pupil is not bright functions as a self-fulfilling prophecy. If teachers act toward

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DR. REISSMAN *is a member of the staff, Mobilization for Youth, and visiting professor, Department of Psychiatry, Columbia University.* *This article is adapted from his address to the conference on programs for the educationally deprived, conducted by the Instructional Programs Branch of the Office of Education. The full address will be published in the conference proceedings, now in press.*

pupils as if they were dull, many pupils will come to function in this way. The average person, even in college, needs reinforcement. The teacher must pick up what he says, appeal to him, and pitch examples to him. The typical teacher does not do these things with a slow child. In my own teaching I easily fall into the habit of rewarding pupils whose faces light up when I talk, who are quick to respond to me, and I respond back to them. I remember what they say and use it in examples. I do not pick up the slow pupil, and I do not respond to him. He has to make it on his own. In the teacher training programs future teachers should be taught to guard against the almost unconscious and automatic tendency to respond to the pupil who responds to him.

Hidden verbal ability

Everybody in the school system has heard, at one time or other, that disadvantaged children have a verbal deficit, that they are inarticulate, nonverbal. But isn't this too simple a generalization? Aren't these children quite verbal out of school? That they can be highly articulate in conversation with their friends is illustrated by the language developed by urban Negro groups, some of which has been absorbed into the main culture.

Many questions about the verbal potential of disadvantaged children must be answered by research. Under what conditions are they verbal? What kind of stimuli do they respond to verbally? With whom are they verbal? What do they talk about? What parts of speech do they use? Martin Deutsch of New York Medical College is doing some significant research—trying to answer these questions. I surveyed some of his findings in my book, *The Culturally Deprived Child*.[1]

Disadvantaged children are often surprisingly articulate in role playing. One day I asked a group of such youngsters, "Why are you sore at the teachers?" Even though I was on good terms with them, I couldn't get much of a response. However, when I held a role playing session in which some of them acted out the part of teachers and others the part of pupils, these "inarticulate" youngsters changed sharply. Within a half-hour they were bubbling over with verbal and sensitive answers to the question I had asked. They were telling me about the expressions on teachers' faces that they didn't like. They reported that they knew the minute they entered the room that the teacher didn't like them and that she didn't think they were going to do well in school. Their analyses were specific and remarkably verbal.

But the quality of their language has its limitations, and herein, I think, lies the deficit. As Basil Berstein indicates, the difference is between formal language and public language, between the language of a written book and the informal everyday language. There is no question in my mind that disadvantaged children are deficient in formal language.

Since the deficit is clear, we might ask, "Why make such an issue of the positive verbal ability of these children?" The reason is that it is easy to believe, and too many people have come to believe, that this deficit in formal language means that deprived people are *characteristically* nonverbal.

If the schools accept the idea that these pupils are basically very good verbally, teachers might approach them in a different manner. Teachers might look for additional techniques to bring out their verbal ability; instead of predicting that they would not go very far in school, they might predict that they would go very far because they have good verbal ability. In other words, an awareness of the positive verbal ability (not merely potential) might lead them to demand more of the disadvantaged child and expect more of him.

Education vs the school

There is a great deal of evidence that deprived children and their parents have a much more positive attitude toward education than is generally believed. This attitude is often obscured by the fact that deprived persons value education but dislike school. They are alienated from the school, and they resent the teachers. For the sake of clarity, we should consider their attitudes toward education and toward the school separately.

A nationwide survey conducted by Elmo Roper after World War II asked, "If you had a son or daughter graduating from high school, would you prefer to have him or her go on to college? Do something else? Wouldn't care?" About 68 percent of the poor and 91 percent of the more prosperous chose college. The difference is significant, but 68 percent is still a large figure and it indicates that a large number of poorer people are interested in a college education for their children.

Why do these people who have a positive attitude toward education have a negative attitude toward the school? These youngsters and their parents recognize that they are second-class citizens in the school, and they are angry about it. From the classroom to the PTA they discover that the school does not like them, does not respond to them, does not appreciate their culture, and does not think they can learn.

These children and their parents do not easily accept such reasons for education as "developing yourself," "expressing yourself," "gaining knowledge for its own sake." They want education much more for vocational reasons.

[1] New York, Harper and Bros., 1962, 140 pp.

Even so, they have a positive attitude toward education, particularly the lower socioeconomic Negro groups. In the Higher Horizons program in New York City the parents have participated eagerly once they have seen that the school system is concerned about their children. One of the positive features of this program and the Great Cities Program is their concern for disadvantaged children. This the disadvantaged have not experienced before; and I believe that even if the programs did nothing else, the parents and children would be responsive and would become involved in the school because of this concern.

Some weaknesses

A basic weakness of deprived youngsters which the school can deal with is the lack of know-how, including the academic know-how and the know-how of the middle class generally—knowing how to get a job, how to appear for an interview, how to fill out a form, how to take tests, how to answer questions, and how to listen. The last is particularly important. The whole style of learning of the deprived is not set to respond to oral or written stimuli. These children respond more readily to visual and kinesthetic signals. We should remodel the school to suit the styles and meet their needs. But no matter how much we change the school to suit their needs, we have to change these children in some ways—in reading, formal language, test-taking, and general know-how.

These weaknesses represent deficiencies in skills and techniques. There is only one value of the lower socioeconomic groups which I would fight in the school—their anti-intellectual attitude. I am very much opposed to spending a lot of time in teaching values to these youngsters. I am much concerned, and in this I am traditional, that the schools impart skills, techniques, and knowledge to them instead of training them to become good middle-class children.

I believe, however, that the attitude of these youngsters toward intellectuals, toward knowledge for its own sake, and similar issues has to be fought out in the schools. These children and their parents are pretty much anti-intellectual at all levels. They don't like "egg heads"; they think talk is "a lot of bull." I would consciously oppose this attitude in the school. I would make the issue explicit; there would be nothing subtle or covert about it. I would state clearly that the school does not agree with them on this point and is prepared to argue about the views they hold.

Summary and implications

I have attempted to reinterpret some of the supposedly negative aspects that characterize the cognitive style of disadvantaged persons and to call attention to their untapped verbal ability. But there are other positive features of the culture and style of the deprived (they are discussed more fully in my book): The cooperativeness that marks the large family; the informality and humor; the freedom from self-blame and parental overprotection; the children's enjoyment of each other's company and lessened sibling rivalry; the enjoyment of music, games, and sports; the freedom from being word bound; and the physical style of learning.

I have also indicated the basic weaknesses of the disadvantaged which the school must try to overcome: Lack of school know-how, anti-intellectualism, and limited experience with formal language. Others should be noted: Poor auditory attention, poor time perspective, lack of test-taking skills, and limited reading ability. The school must recognize these deficiencies and work to combat them. They are by no means irreversible, but even more important, because neglected, the positive elements in their culture and style should become the guidelines for new school programs and new educational techniques.

There are a number of reasons why it is important for schools to emphasize the positive:

It will encourage the school to develop new approaches and techniques appropriate for the cognitive style of the deprived.

It will enable children of low income families to be educated without middle-class values being imposed on them.

It will stimulate teachers to aim high, to expect more and work for more from the children. It will operate against patronization and condescension, and against the inflexibility in the double-track system which prevents the deprived from ever arriving on the main track.

It will curb the school's tendency to overemphasize vocational, nonacademic education for children from low-income families.

It will challenge teachers who realize that they need not aim simply at bringing these children up to grade level but can develop new kinds of creativity.

It will make the school more democratic because different cultures and styles, existing side by side, will interact.

It will enable the teacher to see that both techniques such as role playing and audiovisual aids are useful in eliciting the special cognitive style and creative potential of deprived children.

It will lead to appreciation of slowness, one-track learning, and physical learning as sources of potential strength that require fostering. It will challenge the teacher to take special training in how to respond to these styles, how to listen carefully to one-track persons, and how to reward the slow learner.

JOHN L. HAYMAN, JR., AND JAMES T. JOHNSON, JR.

Research on the context of instructional television

THE DENVER PUBLIC SCHOOLS and the Institute for Communication Research at Stanford University, through a grant from title VII of the National Defense Education Act, are conducting a research project on the context of instructional television. The purpose of the research is to find ways to increase the value of instructional television through classroom and home activities. More than 13,000 5th- and 6th-graders in Denver have taken part in the program, which offers instruction in elementary school Spanish.

Some 400 studies on educational television have been completed on a wide variety of subjects at all levels of instruction. These studies establish without a doubt that students can learn efficiently from educational television. But most studies have only looked into the question of how television instruction compares in effectiveness with regular instruction. We also need to know how effective television in combination with classroom and home instruction can be. A few of the early studies suggest that instruction by television in the home and classroom could be effective and that television and teacher-directed classroom activities used together increase both learning and motivation of pupils and make television more acceptable to teachers. As Schramm has said, "the important question on educational television is no longer whether it is useful, but how it can best be combined with other educational experiences to make learning more efficient." [1]

The Denver Public Schools-Stanford University project, called "Four Years of Research on the Context of Instructional Television," has, since 1960, been testing these four hypotheses:

1. When reinforced by certain classroom activities, instructional television is more effective than when lacking this reinforcement.

2. When reinforced by certain home activities, instructional television is more effective than when it is not reinforced by these activities.

3. When reinforced by certain home and certain classroom activities, instructional television is more effective than when it is without these reinforcements or with only one.

4. Combined with certain kinds of home and classroom reinforcements, instructional television is more effective than when combined with certain other kinds of home and classroom activities.

Foreign language (Spanish) instruction in the elementary school was chosen as the project subject for several reasons: The addition of foreign language instruction to the elementary school curriculum seems to be a coming practice; the shortage of qualified elementary school language teachers calls for a search for teaching aids; and the method of instruction for elementary school foreign language instruction, since it is not frozen by years of use, is open to experimentation.

A joint research team from the Denver school system and the Institute is responsible for the project. A staff member of the Institute works as a full-time member of the project in Denver. The public schools have assigned specialists in education, language, and television teaching and production to the projects and have made the facilities of KRMA–TV, an open-circuit educational station, available to the project.

Two other organizations are cooperating with the schools and the Institute to make the project a success—the Denver County Council of Parent-Teacher Associations and the University of Denver.

The Council assisted in planning parent participation and is administering this part of the project. It informs parents of the project and its needs, recruits participants, distributes materials, collects information needed from participants, informs participants of progress, and encourages them to follow their assigned procedures. The Council has handled its duties efficiently and has worked closely with the research team. Parent participation has been highly successful.

[1] Wilbur Schramm, "What We Know About Learning from Instructional Television," Stanford, Calif.: Institute for Communication Research, 1961, p. 28 (mimeo.).

Dr. Hayman is on the staff of the Institute for Communication Research at Stanford University. He is director for the Institute of the Denver-Stanford Project on the Context of Instructional Television.

Mr. Johnson is director of the Project for the Denver Public Schools. He has been associated with the Denver Public Schools for 14 years. His regular position is that of supervisor in the Division of Instructional Services.

The University of Denver has made available at reasonable rates its high speed computer and data processing equipment and has assisted in machine operation and programing without charge. Its cooperation has saved the project both time and money.

The Denver-Stanford Project, then, is a cooperative venture in the fullest sense. Its progress to date has been accomplished through the efforts of several organizations which have worked together without friction.

The first experiment.—Experimental work began in May 1960 with a preliminary study. About 550 5th-grade pupils in their first year of Spanish instruction took part in a program to compare three methods of television presentation: Lecture, modified lecture with elicited student participation in the classroom, and modified lecture with instructor-student interaction in the studio and student participation in the classroom. Covariance analysis of overall differences between groups produced an F ratio significant at approximately the .075 level. Individual group comparisons based on the results obtained on a criterion test found that pupils in the third group made the highest scores and those in the second group made the lowest.

The results of the preliminary experiment led to the choice of the third presentation method for the television lessons used by the project: Pupils appear on camera, serving both as pacers for the teacher and as models for pupils in the classroom; and questions and comments are directed by the teacher to the classroom audience to encourage overt participation. To assure that the television lessons are of high quality and incorporate the characteristics desired, and to make certain the television experience of one group can be repeated for another group, project directors record all lessons on videotape before actual telecasting. Tapes are reviewed by foreign language and television teaching specialists and are remade if the consultants find them below standard.

The 1960–61 school year.—During the first full year of the project, 1960–61, research was confined to 5th-grade pupils—those in their beginning year of Spanish language instruction. In accordance with the recommendations of the Foreign Language in the Elementary Schools (FLES) group, instruction was entirely audiolingual and did not include grammar or translation. The 15-minute television lessons, viewed three times weekly during school hours as part of the regular curriculum, were supplemented by such activities as a second viewing of the television lesson in the evening, work with parents in the home and viewing of the television lesson by the parents, and teacher-directed classroom practice by either the structural, dialog, or eclectic methods. These supplements were used as single practices in the first semester and in combination in the second.

Reports Published by the Denver-Stanford Project

A New Opportunity for Parent Participation in Education

A Two-Dimensional Covariance Analysis Program for the Datatron 205 Computer

Measurement of Listening Comprehension via Television in Elementary School Spanish Instruction

Development of Programed Learning Materials for Use with Televised Spanish Instruction

Results of the First Year's Research in the Denver-Stanford Project

An Attempt to Measure Academic Achievement Efficiency

Listening comprehension and speaking tests developed by the project were administered at the end of each semester. Analyses of these tests showed these results:

1. Where there was no practice, two viewings of the television lesson were significantly superior to a single viewing.

2. A viewing of the television program again at night combined with help from parents was significantly superior to two viewings without parent help.

3. Dialog classroom practice, used in conjunction with the television series, was significantly less effective than eclectic practice.

4. Eclectic classroom practice appeared to be superior to structured classroom practice, although differences between these groups were not statistically significant.

5. Each of the classroom practices was significantly superior to any other single procedure without classroom practice.

6. Combining classroom practice with a second viewing at night (without parent help) was not significantly different from classroom practice alone.

7. Combining classroom practice with a second viewing and parent help was significantly better than any other type of instructional pattern used.

The 1961–62 school year.—The research design was changed considerably for the second school year (1961–62). Some changes reflected the results of the first year's research. Eclectic classroom practice was adopted for all pupils and the value of parent help was publicized to encourage the greatest possible parent participation. Over 4,000 families participated in the study during the second year. In addition, a few new procedures were added. Sixth-grade pupils in their second year of Spanish language instruction were included in the study, electronic

aids (record players or tape recorders) were placed in some of the 5th- and 6th-grade classes; and reading and writing skills were introduced under varying conditions at the 6th-grade level.

Reading and writing instruction was handled almost entirely in the classroom—that is, it was given only minor emphasis on television. All reading and writing were restricted, however, to material which had been covered thoroughly in the 5th-grade audiolingual instruction. Since there is a question as to the best time to begin reading and writing a foreign language, the 6th-graders were randomly divided in half. One group began reading and writing instruction at the start of the year, the other group at the second semester.

The traditional teacher-directed and the automated or programed instruction methods of teaching the reading and writing of a foreign language were compared. Teachers of the teacher-directed groups attended inservice meetings and used detailed guide books so that exactly the same material would be covered and the objectives of both methods would be similar. The automated programs, which took a full year to develop, consist of some 2,300 frames. All groups in the automated-instruction program used panel-book texts in both the first and second semesters, with the exception of four groups who, in the second semester, used a hand-operated, commercial teaching machine.

At the end of each semester all pupils took listening comprehension tests, and the 6th-grade pupils who had received reading and writing instruction took reading and writing tests. In addition, random samples from each research group were given speaking tests. From the results of the tests, the researchers reached the following conclusions:

1. Electronic aids had no consistent effect on any test at either 5th- or 6th-grade levels. They appeared to make a difference in some individual classes, but the reasons for the difference were not clear.

2. At the end of the first semester, those who had had reading and writing instruction did better on both listening comprehension and speaking tests than those who had audiolingual instruction only. Apparently, instruction in reading and writing had no adverse effect on the other language skills.

3. Pupils who had had teacher-directed reading and writing during the first semester performed significantly better on reading and writing tests than those who had had automated instruction.

4. At the end of the second semester, however, no significant difference in reading and writing scores existed between teacher-directed pupils and those with the automated text. This was true for both those who started reading and writing at the beginning of the year (who had shown a difference at the end of the first semester) and those who started the second semester.

5. The reading and writing performance of pupils using teaching machines was significantly superior to that of the other two groups.

6. Differences in teacher training and experience produced highly significant differences on the reading and writing tests for teacher-directed pupils and pupils receiving automated instruction.

The Denver-Stanford project is investigating the value of electronic aids as a supplement to television in elementary school Spanish instruction. Here 6th-grade pupils are listening to a master voice on a recording. They can compare their pronunciations by recording their own voices. By using earphones and speaking softly, pupils can work at the rear of the classroom while other instruction is in progress.

An important part of the instruction is a 15-minute teacher-directed followup immediately after the television lesson. Here a teacher is using flash cards to prompt Spanish conversation between two pupils. Later she will use the same cards with the entire class so that each pupil can take part. The project found that the teacher's training and experience produced significant differences on reading and writing tests for both machine-taught and teacher-directed pupils.

7. Pupils who had received help from their parents at home performed significantly better on both listening comprehension and speaking tests than those who had not received help at home.

8. The academic average of 5th-grade pupils who had received parent help increased from 4th to 5th grades; the average of those without parent help decreased. The difference was statistically significant.

9. The overall mean of all 5th-grade pupils on the listening comprehension tests was about the same as the mean of the best group during the first year of research.

Present activities.—Active research in the project will continue through the current school year. The project's primary effort at the 5th-grade level this year is directed toward learning more about the effects of electronic aids. Participating fifth-graders are divided into three groups: One group with record players, another with tape recorders (including some 30 dual-channel recorders), and a third group with no electronic aids. Teachers have received extensive instruction in the use of these aids, and the project maintains continuous contact with teachers to insure that the aids are used properly. At the 6th-grade level, the project is directing its primary effort toward clarifying the use of automated instruction and improving reading and writing skills.

The 1961–62 results established that automated instruction can be effective in teaching Spanish reading and writing, but they also suggest that automated instruction can best be used in combination with a teacher-directed method, and not as an entirely separate device. The project is trying a number of combinations of teacher-directed and automated reading and writing instruction. Some 6th-grade classes have Spanish corners containing cultural artifacts, reading materials, and recordings not necessarily instructional. Each child spends some time in the corner in an activity he himself has chosen.

Conclusions.—The research completed so far in the Denver-Stanford project has supported the four original hypotheses. Hypotheses one and two may be considered completely verified, since both classroom and home activities clearly increased the amount children learned from television on every trial.

The project is presently considering a number of important questions related to hypotheses three and four which are still unanswered. Now that it has been determined that television instruction combined with certain other activities is valuable, the question is which of these other activities will most increase learning. The ultimate combination will probably not be found by the Denver-Stanford project, of course, since so many possibilities exist. The project, however, has made considerable progress toward the ultimate combination and has set guidelines for future research.

The extent to which these findings can be transferred to other subject areas is uncertain, of course, and can only be established through experimentation. The implied possibilities should, however, result in greater interest in television as an instructional medium and should generate further research on the most effective use of television in education.

The primary instructional device in the project is the television lesson. Here a television teacher conducting a unit on the family adds interest and meaning to his teaching by working with children, parents, and grandparents at a family fiesta. The children are 6th-graders who serve as model learners in all the lessons. To insure that lessons are of high quality and are uniform for all classes, they are prerecorded before actual telecasting.

The project introduces reading and writing at the 6th grade and is comparing the traditional teacher-directed method of instruction with the programed instruction method in handling this phase of language learning. The pupils here are using program materials in panel-book form. They respond overtly to questions on each page and learn the correct answers by looking at the next page. Thus, they know immediately if their responses are correct.

CHANNELS OF COMMUNICATION

A monthly report on programs and developments both in and outside the Office of Education that are related to the educational uses of television, motion pictures, teaching machines, language laboratories, and other media of communication.—By SETH SPAULDING.

Title VII research projects

To date, 63 research projects in programed instruction have been initiated under title VII, Part A, of the National Defense Education Act. Together, they touch on every subject field; some touch on more than one subject. Mathematics is getting attention in 22 projects; language arts in 14; social and behavioral sciences in 10; physical sciences in 7; biological sciences and foreign language each in 6; the humanities in 5; fine arts in 2; vocational and practical arts and counseling and guidance each in 1; and various other subjects in 7.

Together the projects also cover all levels, from kindergarten through graduate school; some projects are studying more than one level. Kindergarten through grade 2 are under consideration in 7 projects, grades 3–4 in 9; grades 5–6 in 10; grades 7–9 in 11; grades 10–11 in 12; college in 24; and the graduate level in 2.

At least 15 projects are comparing the effectiveness of programed instruction with that of another method of instruction; 4 are trying to find to what extent programed instruction can be used to reach certain educational objectives; 17 are looking for better ways of producing and using programs for teaching machines; and 29 are concerned with broad theories or principles that will be helpful to persons developing materials for programed instruction.

Abstracts and reports

The Science Information Exchange of the Smithsonian Institution is now adding to its store of abstracts of research projects the abstracts of projects under title VII of NDEA. The exchange, which focuses on research currently in progress rather than on published research, soon will have abstracts of 100 titles—projects under title VII—65 for projects of research and experimentation and 35 for projects to disseminate information about the latest developments in the educational uses of the various media.

The Science Information Exchange is supported by the Atomic Energy Commission, Department of Defense, Public Health Service, Veterans Administration, National Science Foundation, National Aeronautics and Space Administration, and the Federal Aviation Agency; and more than 70 nongovernment organizations with national research programs participate. The abstracts, all 1-page 200-word documents, are available without cost to individuals or groups. They are catalogued and indexed, and a scientific staff is available to retrieve any information requested. The Exchange is located in Suite 311, Universal Building, 1825 Connecticut Avenue, NW., Washington 9, D.C.

Final reports of completed title VII projects are available on microfilm or xerox offprint from University Microfilms, Inc., 313 North First Street, Ann Arbor, Mich.; and on loan from libraries participating in the Documents Expediting Service of the Library of Congress.

Dissemination in Texas

The Texas Instructional Media Project, sponsored by the Texas Education Agency in cooperation with the Office of Education and 11 professional education organizations in Texas, has completed its second year of presenting information about new media to Texas educators. It has made more than 600 demonstrations to show more than 27,000 teachers how the new media can be used in the teaching of various kinds of subject matter.

The project has three broad objectives—research, interpretation of experiments, and dissemination of information—and its program has included 9 regional demonstration conferences, 22 local and area workshops, and 2 summer workshops. It has also published bibliographies and progress reports, given consultive services to local schools, and maintained a demonstration school.

In its summer workshops, each 1 month long, the project has trained two 25-member demonstration teams and one group of 20 school-sponsored teachers, who, with further help and consultation from the project, have prepared demonstration lessons for presentation before local, State, and national conventions and have established local material centers. In the local and area workshops, approximately 3,000 teachers have received from 2 to 8 hours of training.

The project has had financial support from several sources. The Federal Government has supplied funds under a title VII contract; the State and local school districts have supplied funds; and manufacturers and distributors of equipment have supplied equipment and materials.

TV course in AV education

A television course in audiovisual education, developed under an early research grant under title VII, continues to be used experimentally in several teacher education institutions. The 42-lesson series was produced in 1960 by a team of educational media specialists from a number of universities working at the University of Wisconsin under its Audiovisual Television Project.

More than 27 colleges and universities from Maine to Hawaii have used the course to give 2,551 students an opportunity to earn graduate or undergraduate credit. In addition, several public school systems have sponsored the course for the inservice training of their teachers in the use of audiovisual materials, and it is estimated that more than 25,000 teachers have taken advantage of the opportunity.

Dr. Spaulding is chief, Research and Services Section, Educational Media Branch, Office of Education.

For example, in Wisconsin, Iowa, and Illinois, under the direction of L. Clinton West, head of the University of Michigan project, seven commercial and educational television stations formed a network to broadcast the course for four cooperating institutions of higher education.

The widespread use of the course has stimulated many institutions to produce similar courses locally. Many have used the course as a guide in developing other courses on the same subject. In a recent experiment in New Orleans, the curriculum and educational television departments of the public school system presented a short course adapted from the Wisconsin course to bring teachers some new ideas about both old and new instructional techniques and materials. The course carried no credit, but 500 teachers interested in improving their knowledge and skill took it. Because of the favorable response, the Louisiana State University at New Orleans offered the full course for credit last fall.

The general reaction of persons administering the course is that the AV–TV course is more comprehensive than the usual on-campus audiovisual course. An analysis of data collected over the past 3 years indicates that students who take the course do incorporate many effective audiovisual techniques in their day-to-day teaching. In places where the course has been used, schools report a marked improvement in their instructional programs and a sharply increased demand for more instructional programs.

Great Plains Library

The Great Plains Regional Instructional Television Library, one of three pilot television libraries established under title VII, reports considerable progress in its program. The GPRITL was activated on February 1, 1962, by a contract between the University of Nebraska and the Office of Education. The purpose of the Library is to acquire, store, distribute, and produce instructional materials on video-tape or kinescope and to make them accessible to the educational institutions of Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Wyoming, Colorado, and New Mexico.

The Television Committee of the North Central Association of Colleges and Secondary Schools has endorsed the Library.

An 18-man Policy Board and a professional staff of two determine major Library policies. The board represents all levels of education, public and private, as well as State departments of education and professional associations. A 20-man Operations Committee represents educational television in each of the 12 States and determines operational details.

The telecourses the Library is acquiring and distributing fall into two broad categories:

1. Courses pertinent to or usable within the Great Plains region.

2. Courses meeting the needs of educators within the region as determined by surveys. These are likely to be units of materials that are very new, difficult to explain, difficult to demonstrate, or requiring resources not commonly available.

Before it acquires a course, the Library makes a formal evaluation of both video and printed materials. It submits six video presentations at a time—these are chosen at random—to two committees working independently of each other. The committees range in size from 5 to 10 members, all selected by the Operations Committee. Each committee is composed of one or more master teachers of a subject, one or two supervisors in a subject, an expert in methodology, a representative of a State department of education, a curriculum consultant, and a member of an educational television production staff; they receive no compensation.

To date the Library has endorsed seven courses:

Course title	*Produced by*
General Psychology	University of Missouri
Focus—High School Social Studies.	21-Inch Classroom, Boston.
Basic Electricity—High School.	Denver Public Schools
Earth and Space Science—Junior High School.	Minnesota Junior High Science Television Council.
Elementary Literature—Elementary School.	Nebraska Council for Educational Television, Inc.
Physical Education—Grades 1 and 2.	Columbus (Ohio) Public Schools.
Physical Education—Grade 3.	Columbus (Ohio) Public Schools.

Some educators are interested in courses for next fall. Requests for information and preview materials have exceeded expectation.

The Library is making minimal charges for its services, under a policy established by an ad hoc committee of the Policy Board to encourage exchange. A definite test of the Library as a self-supporting center will not come until its third year of operation, when a wide selection of course material can be offered and a more realistic price established for services and overhead.

For further information, write to the Great Plains Regional Instruction Television Library, University of Nebraska, Lincoln 8, Nebr.

Seminars at Alameda

Under a title VII contract, Alameda State College this spring is holding 3 seminars on the training of specialists in the use of a wide range of instructional resources, from audiovisual materials to teaching machines, television, and language laboratories. Under the guidance of a board of ten eminent specialists in such fields as library, film, radio, television, audiovisual materials, and communication, the seminars will try to get consensus on both the content and the pattern of a training program.

Each seminar will include 12 persons selected by the board and the project staff. Each seminar will focus on the training of one particular group of specialists: One, on coordinators of the educational media and audiovisual services in a building or local school; one, on the directors or administrators of large districts or intermediate (county) units; and one, on the staff of colleges and universities. For further information about the seminars, write to Robert O. Hall, Alameda State College, Hayward, Calif.

CLARENCE B. LINDQUIST

Entering levels and college courses in freshman mathematics

THE KIND of preparation that students receive in high school has always concerned college authorities because collegiate programs have to be based on the level of the entering student's training. In recent years the importance of the level of previous training in mathematics has increased greatly because of the substantial changes taking place in mathematics curricular content—partly in response to the growth and development of high-speed computing—and because, in the face of staffing shortages, swelling college enrollments have accentuated the problem of providing entering college students with instruction that properly belongs in the high school.

The mathematics survey

To determine the status of, and trends in, mathematics instruction in colleges and universities, the Office of Education, in 1960–61, mailed out a questionnaire on mathematics programs to 1,013 colleges and universities offering degree curriculums in mathematics and 70 other institutions, such as engineering colleges, offering substantial programs in mathematics but no degrees. Separate campuses of multicampus institutions were counted as separate institutions. A total of 877 institutions—or about 81 percent—completed and returned the questionnaire.

I have prepared several publications on the results of this survey, including a circular for the Office of Education, *Guide to Undergraduate Programs in Mathematics*,[1] and an article, "Mathematics in College and Universities: A Survey," in the *Educational Record*, January 1963, a quarterly publication of the American Council on Education. This article is a report on the findings of the study on the freshman level of college mathematics and its meaning for high school instruction and its articulation with college work. A final detailed report of the complete survey is in preparation.

[1] U.S. Government Printing Office, Washington 25, D.C., 25 cents.

Dr. Lindquist is specialist for mathematics and physical sciences in the Division of Higher Education. He came to the Office of Education in 1957 from the University of Minnesota, Duluth, where he was head of the department of mathematics and engineering. He taught at the U.S. Naval Academy from 1941 to 1946. He is a graduate of Wisconsin State College at Superior and the University of Wisconsin.

Entering freshman levels

The respondents were all asked to state the numbers of entering freshman in the three levels of introductory mathematics: Courses of a level lower than algebra and trigonometry; college algebra, trigonometry, and other courses of equivalent level; and analytic geometry, calculus, and other courses of equivalent level and above. Of the 877 institutions replying, 855 answered this question. Table 1 shows the data for all the responding institutions, as well as for institutions in various categories.

By far the largest number of freshmen were enrolled in college algebra, trigonometry, and courses of equivalent level. Of the 305,668 freshmen represented in the returns, 159,183, or 52.1 percent, began their mathematics with courses in these subjects. An almost equal number were taking the less or more advanced courses: 76,161, or 24.9 percent, were in courses of a level lower than algebra and trigonometry, and 70,324, or 23.0 percent, in analytic geometry, calculus, and courses of equivalent level or above.

In the universities over half (55.1) percent were enrolled in basic algebra and trigonometry or courses of equivalent level; a quarter were enrolled in more advanced courses, and a fifth in less advanced courses. At the liberal arts college the percentages were about the same, except that a quarter of the freshmen were enrolled in the less advanced mathematics and a fifth in the more advanced. Less than 10 percent of the freshmen at teachers colleges were enrolled in courses of a level equivalent to analytic geometry and calculus. Nearly a half (46.6 percent) were in courses at a level below college algebra and trigonometry, and 43.5 percent were enrolled in the basic course. At the technological institutions, however, enrollments were quite different: 50.9 percent of the entering freshmen took advanced mathematics courses, 34.9 percent took basic courses, and only 14.2 percent took the low level courses.

A little over half (53.4 percent) of the entering freshmen at public colleges were at the algebra-trigonometry level, about a third in the lower level courses, and a sixth in higher level courses. Private institutions had just the reverse—a third of the entering freshmen were in the higher level courses, a sixth in the lower level.

Geographic regions had striking differences. The North Atlantic region had relatively low percentages at the low and basic levels: 40.2 percent of freshmen entering colleges in this region took advanced courses. In fact, 32 institutions (mostly private), or about 1 out of every 8, in the region offered no courses lower than analytic geometry or calculus. This is in striking contrast to the Southeast region, in which only 12.0 percent of entering freshmen took advanced courses. Only two institutions in this region offered mathematics no lower than analytic geometry and calculus.

The size of enrollment seems important only at the extremes. In 1960, the largest schools enrolled only 22.0 percent of their incoming freshmen in the low level courses. On the other hand, the smallest schools enrolled 58.1 percent of their freshmen in the basic courses and only 15.8 percent in advanced courses. These were the largest and the smallest of all the groups.

Table 1.—Distribution of entering freshmen by course level in mathematics during fall 1960 in 855 U.S. colleges and universities: By type, control, region, and enrollment size

(22 institutions of the 877 in the survey were unable to give the breakdown by level)

Category of institution	Number of institutions providing data	Entering freshmen enrolled in					
		Courses of level preceding college algebra and trigonometry		College algebra, trigonometry, and courses of equivalent level		Analytic geometry, calculus, and courses of equivalent level and above	
		Number	Percent	Number	Percent	Number	Percent
All institutions	855	76,161	24.9	159,183	52.1	70,324	23.0
By type							
Universities	124	25,972	19.9	71,962	55.1	32,724	25.0
Liberal arts colleges	566	29,162	25.2	63,239	54.5	23,534	20.3
Teachers colleges	125	18,192	46.6	16,994	43.5	3,863	9.9
Technological schools	40	2,835	14.2	6,988	34.9	10,203	50.9
By control							
Public	274	55,283	30.5	96,774	53.4	29,124	16.1
Private	581	20,878	16.8	62,409	50.1	41,200	33.1
By region							
North Atlantic	247	14,274	18.4	32,036	41.3	31,170	40.2
Great Lakes and Plains	274	21,930	23.7	51,227	55.3	19,459	21.0
Southeast	191	23.069	29.7	45,314	58.3	9,279	12.0
West and Southwest	143	16,888	29.2	30,606	52.8	10,416	18.0
By enrollment size							
Over 5,000	130	31,418	22.0	75,247	52.7	36,174	25.3
1,500–5,000	214	26,264	28.3	46,088	49.6	20,593	22.1
700–1,499	253	12,125	26.6	23,680	52.1	9,693	21.3
Under 700	258	6,354	26.1	14,168	58.1	3,864	15.8

There seem to be several reasons for the variations brought out by the survey. Higher admissions requirements at the technological institutes and universities eliminate many who would take the low level courses. In addition, technological schools naturally attract those both gifted in and relatively well educated in mathematics.

Variations between the public and private institutions may stem from the fact that there are so many teachers colleges among the public institutions reporting. The teachers colleges, as we have seen, had the highest percentage at the low level and the lowest at the high level. Private universities have far higher admissions requirements than public universities, which are often compelled by law to take almost any applicant.

The regional differences were probably a product of the regional differences in high school preparation. The enrollment differences can be explained by the fact that a small school cannot usually afford the expense of holding advanced classes for a very few qualified students.

Course offerings and enrollments

The questionnaire asked respondents to indicate the undergraduate mathematics courses listed in their curricular offerings, which of these courses were actually offered in fall 1960, and the enrollment in these courses during fall 1960. The data compiled from replies to these questions are shown in table 2.

Sixteen different freshmen courses were cited with sufficient frequency and enrollment to be listed separately in table 2. The courses most frequently given in the first year were college algebra, trigonometry, and mathematical analysis. They were given by 65.2 percent, 62.9 percent, and 42.9 percent of the institutions replying. Enrollment figures showed that college algebra, with an enrollment of 82,125 sudents, or 21.9 percent of the freshman mathematics enrollment, was the most popular single freshman course, and that analytic geometry and calculus (offered by 41.0 percent of the institutions) was second with 50,874 students, or 13.6 percent of the total. Mathematical analysis was next with 46,151 students, or 12.3 percent of the total enrollment.

A total of 246 institutions, or 28.1 percent of those responding, reported that they offered a basic concepts course in mathematics, with a total enrollment of 27,512 students, or 7.3 percent of the total freshman mathematics enrollment. This enrollment reflects a growing trend, for in recent years more and more colleges and universities have been offering such courses. In fact, many institutions are offering a new course called finite mathematics. The topics covered in a basic concepts course include elementary set theory, logic, and mathematical structure. These courses are often recommended to students to meet general education requirements because they focus on basic understanding of mathematics rather than on the acquisition of skills or techniques which the student not majoring in mathematics or science will soon forget.

Table 2.—Extent of offerings and enrollments in fall 1960 in freshman-year mathematics courses in 877 U.S. colleges and universities

Course	Institutions offering course		Of institutions offering course, those offering in fall 1960		Enrollment fall 1960	
	Number	Percent	Number	Percent	Number	Percent of total freshman mathematics enrollment
Plane geometry	145	16.5	84	57.9	3,277	0.9
Solid geometry	96	10.9	50	52.1	1,429	.4
Elementary algebra	148	16.9	109	73.6	9,183	2.4
Intermediate algebra	303	34.5	256	84.5	27,907	7.4
College algebra	572	65.2	544	95.1	82,125	21.9
Trigonometry	552	62.9	408	73.9	35,926	9.6
Analytic geometry	332	37.9	228	68.7	17,957	4.8
Analytic geometry and calculus	360	41.0	318	88.3	50,874	13.6
Mathematical analysis	376	42.9	354	94.1	46,151	12.3
Basic concepts (including finite mathematics)	246	28.1	228	92.7	27,512	7.3
General mathematics	233	26.6	216	92.7	32,461	8.7
Calculus	91	10.4	72	79.1	5,212	1.4
Mathematics of finance	148	16.9	93	62.8	8,02	2.1
Elementary statistics	105	12.0	61	59.1	3,827	1.0
Mathematics for elementary school teachers	153	17.4	117	76.5	9,761	2.6
Business mathematics	45	5.1	40	88.9	5,886	1.6
Other	.....	.....	.....	.....	7,316	2.0
Total	.....	.....	.....	.....	374,830	100.0

Prerequisite mathematics instruction

One question in the survey dealt with the nature and extent of prerequisite mathematics for students who are taking mathematics in college for the first time and whose high school background was inadequate for the introductory courses the college requires in its regular mathematics program. Most colleges regard trigonometry and college algebra as parts of the regular program. Some colleges, however, consider trigonometry and college algebra as prerequisite courses since analytic geometry and calculus are regular introductory courses. A few colleges listed intermediate algebra and solid geometry, courses usually given in high school, as regular courses.

Of the institutions reporting, 508, or 58.9 percent, offered a prerequisite course or courses. Intermediate algebra was the course most frequently offered, with 296, or 58.3 percent, of all institutions offering prerequisite instruction. Elementary algebra was offered by 148 (29.1 percent) of the institutions; plane geometry by 145 (28.5 percent); solid geometry by 90 (17.7 percent); trigonometry by 50 (9.8 percent) institutions; and college algebra by 35 (6.9 percent). A total of 69 institutions, or 13.6 percent, indicated that they gave prerequisite courses other than those just listed.

My tabulations show that 77.1 percent of the colleges give credit for college algebra when it is offered as prerequisite instruction; 73.3 percent for intermediate algebra; 67.7 percent for solid geometry; 58.0 percent for trigonometry; 35.8 percent for elementary algebra; and 31.0 percent for plane geometry.

Eighty-four institutions, or about 10 percent of the respondents, stated that they had offered prerequisite instruction but had discontinued it within the 10 previous years. Of those who reported discontinuing prerequisite instruction, 77 percent were liberal arts colleges, although they were only 66 percent of the responding institutions. On the other hand, only 6 percent of the teachers colleges had eliminated such courses, although they were 15 percent of the respondents. A larger percentage of the private institutions than public institutions had dropped such instruction. Enrollment was a controlling factor in dropping such courses. The largest institutions, 16 percent of the respondents, were 36 percent of those who dropped the courses. The smallest colleges, 30 percent of the respondents, were only 10 percent of the institutions eliminating them.

The respondents gave several reasons for dropping prerequisite courses: Better high school preparation; staffing problems and the priority of regular course instruction; and the feeling that prerequisite instruction more properly belongs in the high school.

MATHEMATICS is the most rapidly growing discipline among the major disciplines, in terms of the number of bachelor's degrees awarded. In 1954–55 there were 4,034 bachelor's degrees in mathematics (including statistics and actuarial science) conferred by U.S. institutions. In 1960–61 the number had increased to 13,127. On the basis of a survey by the Office of Education of junior-year majors, it is estimated that 15,100 bachelor's degrees in mathematics were conferred in 1961–62, compared to 16,100 bachelor's degrees in all the physical sciences combined. In 1954–55, when 10,516 bachelor's degrees in all the physical sciences were awarded, the number of degrees in mathematics was less than 40 percent of the number in all the physical sciences. Mathematics has almost caught up.

Computer science and technology are creating new opportunities for graduates in mathematics, and the need for persons with competency in mathematics has been accelerated by our strides in space science and electronics. For the computing field alone, an official of the Association for Computing Machinery estimates, about 300,000 programers will be needed in the next 8 to 10 years. Many of these positions will require college-level mathematics or a degree in mathematics.

Not only are more and more persons basing their careers on mathematics, but there are more and more educators who are recognizing the importance of mathematics as an aid in the study of other subjects, as well as a part of general education. For these reasons, we need to continually study the problem of articulation in mathematics between high school and college in order that students may proceed from one level to the other with minimum loss of time and effort. Such articulation will require understanding and cooperation on the part of both high school and college faculties and administrators.

Music curriculum publication

THE CULTURAL AFFAIRS BRANCH of the Division of Continuing and Cultural Education is hard at work gathering material from which to prepare an annotated bibliography of curriculums for music education in public schools in the United States. The Branch has sent letters to directors of music education (or officials in charge of music education) in all the States and Territories requesting that they send copies of their recent music curriculums to the Office and update lists of curriculums which the Office already has. In addition, the Branch has sent out a similar letter to school systems in all counties and cities with 50,000 or more people.

The bibliography—scheduled for publication in the next fiscal year—will be a reference on teaching practices among music teachers in U.S. public schools. The Branch plans to go out on its own to gather information when State departments or school systems are unable to comply with the request. Insofar as the Office knows, it will be the first publication of its kind.

School administrators whose schools have music programs and teachers of music in public schools can assist in the preparation of the bibliography by sending copies of their curriculums to the Continuing Education and Cultural Affairs Branch of the Office of Education, Washington 25, D.C., in care of Harold Arberg, music education specialist.

Statistic of the Month

Illiteracy in the U.S.

The U.S. illiteracy rate—the percentage of the population 14 years old and older who are unable to read and write—is down to 2.4 percent, compared to 3.3 percent in 1950, 4.8 percent in 1930, and 11.3 percent in 1900.

The Bureau of the Census, source of these figures, defines an illiterate as a person "unable to read and write a simple message either in English or in any other language." The term "illiterate" is not to be confused with "functional illiterate," often used to mean a person who has completed fewer than 5 years of school. In 1960 the United States had approximately 3 million illiterates but more than 8 million functional illiterates.

When Census first collected data on illiterates, in 1840, it found that 22 percent of the population 20 years old and older were judged unable to read and write. Because of the methods then used for collecting data, however, Census now regards this percentage as an underestimate. By 1870 the methods had been refined to the point where the data obtained were about as reliable as those in more recent surveys; in that year 20 percent of the population 10 years old and older were found to be illiterate.

All States have made progress in their efforts to eradicate illiteracy, but they still vary considerably from one another. According to Census estimates for 1960, as many as 31 States and the District of Columbia have a better record than the Nation as a whole; all the rest but one have a worse record. Iowa, with only 0.7 percent illiteracy, is at the top of the list; Louisiana, with 6.3 percent, is at the bottom. Obviously there is still room for improvement though, as Census points out, some illiteracy is inevitable as long as there are persons physically or mentally incapable of learning to read and write.

The source of the table is Current Population Reports, Series P–23, No. 8, "Estimates of Illiteracy, by States, 1960," Washington 25, D.C., Bureau of the Census, February 12, 1963, 2 pp. Copies are available from the Bureau of the Census for 10 cents each.

—W. Vance Grant, Educational Statistician, Office of Education.

Illiteracy in the United States, by State, 1900 to 1960

[Data for 1900 through 1930 refer to population 15 years old and older; for 1950 and 1960, to population 14 years old and older.]

State	1900	1910	1920	1930	1950[1]	1960[1]	
	Percent	Percent	Percent	Percent	Percent	Percent	Number
New England:							
Maine	5.5	4.5	3.6	3.0	2.0	1.3	9,000
New Hampshire	6.7	5.1	4.9	3.0	2.0	1.4	6,000
Vermont	6.4	4.2	3.3	2.4	1.7	1.1	3,000
Massachusetts	6.5	5.7	5.3	4.0	2.8	2.2	83,000
Rhode Island	9.2	8.5	7.2	5.5	3.1	2.4	15,000
Connecticut	6.5	6.6	6.9	5.1	3.1	2.2	41,000
Middle Atlantic:							
New York	6.1	6.1	5.6	4.1	3.5	2.9	355,000
New Jersey	6.5	6.2	5.8	4.3	2.9	2.2	99,000
Pennsylvania	6.9	6.6	5.2	3.5	2.7	2.0	166,000
East North Central:							
Ohio	4.5	3.6	3.2	2.5	1.9	1.5	99,000
Indiana	5.2	3.4	2.5	1.8	1.7	1.2	40,000
Michigan	4.8	3.7	3.4	2.2	2.0	1.6	84,000
Wisconsin	5.4	3.6	2.8	2.1	1.7	1.2	35,000
Illinois	4.8	4.2	3.8	2.7	2.3	1.8	128,000
West North Central:							
Minnesota	4.6	3.4	2.1	1.4	1.5	1.0	23,000
Iowa	2.7	1.9	1.2	.9	.9	.7	14,000
Missouri	7.0	4.7	3.4	2.5	2.1	1.7	52,000
North Dakota	6.1	3.4	2.5	1.7	2.3	1.4	6,000
South Dakota	5.8	3.2	1.9	1.4	1.5	.9	4,000
Nebraska	2.6	2.2	1.5	1.3	1.2	.9	9,000
Kansas	3.3	2.5	1.8	1.4	1.3	.9	14,000
South Atlantic:							
Delaware	13.2	9.0	6.6	4.4	2.7	1.9	6,000
Maryland	12.1	7.8	6.1	4.2	2.7	1.9	41,000
District of Columbia	9.4	5.4	3.0	1.7	1.8	1.9	11,000
Virginia	24.3	16.2	12.2	9.7	4.9	3.4	94,000
West Virginia	12.6	9.2	7.2	5.5	3.5	2.7	35,000
North Carolina	30.1	20.2	15.0	11.5	5.5	4.0	125,000
South Carolina	37.4	27.6	20.9	16.7	7.9	5.5	87,000
Georgia	32.1	22.1	16.7	10.4	6.9	4.5	120,000
Florida	23.4	14.4	10.2	7.7	3.9	2.6	92,000
East South Central:							
Kentucky	18.1	13.1	9.4	7.3	4.3	3.3	70,000
Tennessee	21.9	14.7	11.3	8.0	4.7	3.5	88,000
Alabama	35.1	24.2	17.8	14.0	6.2	4.2	93,000
Mississippi	34.1	24.4	18.8	14.8	7.1	4.9	71,000
West South Central:							
Arkansas	21.3	13.4	10.2	7.6	5.0	3.6	45,000
Louisiana	39.6	29.9	23.4	15.1	9.8	6.3	137,000
Oklahoma	11.7	6.2	4.1	3.1	2.5	1.9	32,000
Texas	15.6	10.6	8.9	7.3	5.4	4.1	272,000
Mountain:							
Montana	6.6	5.1	2.5	1.9	1.8	1.0	5,000
Idaho	5.1	2.5	1.7	1.2	1.3	.8	4,000
Wyoming	4.4	3.6	2.3	1.8	1.7	.9	2,000
Colorado	4.5	4.1	3.6	3.1	2.0	1.3	15,000
New Mexico	35.7	21.7	17.4	14.9	6.6	4.0	24,000
Arizona	30.0	21.6	15.9	11.0	6.2	3.8	33,000
Utah	3.6	2.8	2.2	1.4	1.4	.9	5,000
Nevada	13.8	6.9	6.4	4.8	2.2	1.1	2,000
Pacific:							
Washington	3.4	2.2	1.9	1.1	1.3	.9	18,000
Oregon	3.7	2.1	1.6	1.1	1.2	.8	10,000
California	5.3	4.0	3.6	2.8	2.2	1.8	203,000
Alaska	40.6	26.5	24.6	20.5	6.3	3.0	5,000
Hawaii	35.2	29.2	21.2	17.5	8.4	5.0	21,000
Total U.S.[2]	11.3	8.3	6.5	4.8	3.3	2.4	3,055,000

[1] Estimated. [2] Includes Alaska and Hawaii in all years.

The Regina High School, Cincinnati, Ohio, used NDEA loan funds to convert a general purpose room (above left) into a new classroom and biology laboratory (above center and right). The laboratory is equipped with monocular microscopes, a stereoscopic microscope, overhead projector, ear and eye models, other items useful in teaching biology, and counter storage space along two walls.

NDEA loans to private schools

GEORGE C. DECKER

Title III of the National Defense Education Act of 1958 authorizes the expenditure of Federal funds for laboratory and other special equipment that will strengthen education in science, mathematics, and modern foreign language and for minor remodeling of laboratory space in elementary and secondary schools. Section 305 of the act reserves 12 percent of the funds appropriated for this purpose for loans to private nonprofit elementary and secondary schools and directs the U.S. Commissioner of Education, as administrator of the act, to allot the funds among the States on the basis of their proportion of the total enrollment in U.S. private schools. In his article below Dr. Decker discusses the first 4 years of the loan program.

TWO YEARS ago Regina High School in Cincinnati, Ohio, had only two microscopes; now it has enough to make laboratory study profitable.

Regina is one of the 207 private nonprofit schools—independent, Catholic, Hebrew, Protestant, and other—that have used loan funds authorized by the National Defense Education Act of 1958 to purchase laboratory and special equipment needed in teaching science, mathematics, and modern foreign language. All together these schools have borrowed $2.7 million, in loans ranging from a few hundred dollars to more than $50,000. But whether the schools got large or small loans, all have made their own choice of laboratory and special equipment and developed their programs as they saw fit, without Federal interference. And all have used their loan funds to give the

Dr. Decker, until recently chief of the Loans to Schools Section, is Assistant Director, Division of Vocational and Technical Education for Program Evaluation, Manpower and Training Act, in the Office of Education. He came to the Office at the end of World War II from the U.S. Navy, where he served in the Bureau of Naval Personnel, Officer Candidate Training. In the Office he has served in the administration of the veterans educational facilities program, school assistance for federally affected areas, and the college housing program.

92,600 pupils initially enrolled better instruction in science, mathematics, and modern foreign language.

Some schools have used their loans to improve instruction in only one field; others, in two or three fields. Of the 207 schools, 195 have equipped their science laboratories; 110 have installed language laboratories; and 47 have bought instructional devices for mathematics classes. Schools that have not completely equipped laboratories have bought balances, films, slides, dissecting sets, maps and charts, phonographs, recorders and recordings, television receivers, reference books, and numerous other items. Only a few schools have used funds for remodeling laboratories.

Every year the majority of requests for loans have been for science equipment, but every year requests for foreign language laboratories have increased—from 12 percent of the total in 1960 to 30.4 percent in 1961, to 43.6 percent in 1962. Furthermore the size of each loan for languages has also increased. This upward trend in number and amount of loans for language laboratories is following the national trend toward increased interest in foreign languages.

Loans have been made to schools in 43 States and Puerto Rico. In general the geographic distribution is comparable to the number of private schools in the States and Territories.

Most of the loans have gone to secondary schools. In 1962, a fairly typical year, 64.1 percent went to secondary schools, 7.7 percent to elementary (the same as in 1961), and 28.2 percent to schools offering both elementary and secondary instruction.

Schools have used their loans for one or more of these major purposes:

	Percent of schools	
	1959–60	*1962*
To offer courses for the first time	40	66
To equip new facilities	36	46
To provide for increased enrollment	21	61
To install modern foreign language laboratories	18	43
To add to laboratory space	21	41
To replace old and obsolete facilities	10	31
To meet accrediting standards	15	20
To introduce programs for the gifted	10	10

A majority of the projects for which schools have borrowed funds have been satisfactorily completed, and instruction has been improved for approximately 84,000 pupils in these subject fields:

Science	50,889
Mathematics	10,654
Modern foreign languages	22,219

But these are only the first of the pupils to benefit from the new equipment and courses these schools have added. Other pupils will follow them, and they too will benefit.

The repayment record of the private schools is exceptionally good. Ten schools have already repaid their loans in full, ahead of schedule, and others are making payments on schedule. By June 30, 1962, nearly a half million dollars had been repaid:

Fiscal year loan	*Principal*	*Interest*
1959	$297,763.81	$87,212.62
1960	83,194.90	31,126.34
1961	65,759.47	17,715.28
1962	1,200.42	193.40
	447,918.60	136,247.64

The interest rate on these loans has fluctuated from month to month; in 1962, for example, it ranged from 3¼ percent to 3⅝ percent.

Boys at Fishburne Military Academy, Waynesboro, Va., work at one of the new two-man desks in the physics-chemistry laboratory. Each desk has a sink; gas, water and electricity taps; and storage space for apparatus. The laboratory also has new plastic embedded specimens, a plastic dissectable torso, Tesla coil, and other supplies. Fishbourne boys also study in a new electrically equipped language laboratory installed with the help of an NDEA loan.

The pupils enrolled in schools with loans represent only about 1.5 percent of the estimated 1.6 million pupils in U.S. private, elementary, and secondary schools. Judging by the number of inquiries the Office receives about the program, other private schools need equipment, and yet loan funds are going unused. In fiscal year 1962, for example, $6,480,000 in Federal funds was made available to the program and allocated among the States. During the year 39 loans, totaling $671,727, were made to schools in 19 States. Since the act makes no provision for reapportioning funds, the unused $5,808,273 reverted to the Treasury at the end of the year. At the same time

From top to bottom

Long Island Lutheran High School, Brooksville, has bought new furniture and equipment for general science, biology, chemistry, physics, and space science laboratories. Here pupils are working in their chemistry laboratory, which is completely equipped for semimicro experimentation.

At Worcester Academy, Worcester, Mass., boys have a much greater opportunity than pupils formerly had to listen to foreign language correctly spoken.

At Cathedral High School, Springfield, Mass., boys in advanced physics are using Harth optical apparatus to measure diffusion, refraction, and reflection of light through various filters, lenses, and prisms.

The Hebrew Academy, Miami Beach, Fla., has equipped a separate section of its new building for science study, provided special experimental facilities for gifted children, and general laboratory facilities for elementary and junior high school departments. The astronomy club uses the reflected telescope on the platform outside the building. Here pupils are working in their earth science laboratory with meteorological equipment.

some States had to scale down their requests or spread them over 2 or more years because the funds in their States had been exhausted. The Office has recommended that the act be amended to permit reallocation of unused funds. But even if reallocation had been authorized, millions of dollars would have gone unused, both in 1962 and in every other year of the program.

Why have not more private schools come into this program, which is endorsed by three major associations of private schools? There are perhaps many reasons: they are not used to purchasing equipment on a loan basis; additional space for new or expanded laboratories is not available; new construction or major renovation is increasingly expensive; science, mathematics, and modern foreign language teachers are difficult to secure; operating funds for new or additional programs are hard to raise; much of the financing of private schools is through gifts from friends, alumni, and others and school officials may fear that acceptance of Federal funds might disturb these established sources of support; and some are still not familiar with the terms of the program.

To be eligible the schools must be privately controlled, adequately supported and financially responsible; they must be organized and operated as nonprofit schools; and they must offer elementary or secondary instruction or both, as determined under State law.

Officials who are interested will find basic facts on the program in the pamphlet *Loans for laboratory and other special equipment for science, mathematics, and modern foreign language* (OE–21022), free from the U.S. Office of Education, Washington 25, D.C.

AD Minutes Briefly noted---- for the busy School Administrator

Material for this department is prepared by the staff of the School Administration Branch, Division of State and Local School Systems.

The placement project of the School-California State Employment Service has expanded its services to include an additional employment service counselor in San Francisco. The new counselor is available by appointment to talk with potential school dropouts, holds conferences with students at the school, arranges for after-school work, advises students on the urgency of acquiring skills while in school, and guides the school dropout to use the local employment service, where continuing counseling is available to persons seeking suitable employment.

The St. Louis Board of Education has approved a new transfer and suspension policy intended to keep incorrigible students from interfering with other students' work. Under the new policy, a student may be permanently barred from attending the school that suspended him.

The Washington, D.C., School Board has approved a change in its policies to permit the indefinite suspension of unruly pupils under 16 years old. By a vote of 5 to 4, the board turned down the superintendent's proposal to end the ban on corporal punishment.

The Minnesota Board of Education, under a new regulation, will require a person to have 5 years of training to qualify for a teaching certificate. The regulation, which is to become effective September 1965, will apply to public and private elementary and high school teachers currently in training. After the effective date, new teachers with only 4 years of training may apply for a provisional teaching certificate which will be good for 2 years and renewable for 5 additional years.

In the 469 Iowa school districts maintaining approved public 4-year high schools for the 1962–63 school year, 68 percent of all classroom teachers are women, 74 percent of whom are married. However, the number of men teachers has increased in the past 10 years: from 3 percent to 8 percent in elementary schools; from 38 percent to 51 percent in junior high schools; and from 51 percent to 65 percent in senior high schools.

Children learn better under desirable atmospheric conditions than under the marginal conditions typical of many classrooms. This is the conclusion the Center for Research in School Administration, State University of Iowa, drew from its 6-week study of 120 fourth-grade pupils. The pupils were divided into 2 groups—an experimental group and a control group—matched in academic ability, family background, and school experience.

The experimental group was taught in a classroom with desirable atmospheric conditions—temperature between 70 and 75 degrees, humidity between 40 and 60 percent, and air movement from 20 to 40 cubic feet a minute. The control group was taught in a classroom where temperature ranged between 75 and 80, humidity had a wider range, and air velocity was lower than in the experimental classroom. The superior performance of the experimental group in reasoning and other tasks has prompted the researchers to schedule similar investigations with classes from the kindergarten through college.

Newark State College and the Newark Public School System have joined in a campaign to encourage and prepare more beginning teachers to accept the challenges peculiar to teaching in depressed urban neighborhoods. A pilot group of 17 student teachers has volunteered for the program which includes intensive orientation by sociologists, psychologists, and social workers from the community; visits to several slum schools; conferences with teachers; observations of children; and meetings with parents. The college plans to expand the program by initiating graduate courses that would enable city teachers to earn a master's degree in urban education.

New York State legislature has provided $150,000 for the first year of a 3-year study on the feasibility of a longer school day and a longer school year. The study will start immediately.

The Michigan Curriculum Committee for Better Human Relations has developed a policy guide, "The Treatment of Minority Groups in Textbooks," at the request of representatives from the approved textbook publishing companies. Lynn M. Bartlett, State superintendent of education, has adopted the statement for the Michigan Department of Public Instruction and sent it to the American Textbook Publishers Institute, which is bringing it to the attention of all member publishers.

The committee functions under Michigan's Curriculum Program. Beginning in 1935 with one committee of 6 members as a cooperative effort of

citizens in the State to improve education, the program has now grown to 31 committees with nearly 1,000 members. The State superintendent appoints committee members from all sections of the State to work independently in many subject fields, such as agricultural education, business education, curriculum research, education of exceptional children, foreign language, guidance, family living, international understanding, mathematics, and science.

By a margin of 3 to 2, Detroit voters have rejected a proposed school tax levy. As a result, the fourth largest school system in the Nation faces a loss of one-third of its total school operating revenue, and under Michigan law another election cannot be held until November 1964.

Immediately following the defeat, Governor Romney called a meeting with Detroit public school officials and State legislative leaders to explore the possibilities of new legislation that will permit a special school millage election.

The amount of money spent on university research has multiplied 30 times during the past 20 years, according to the Southern Regional Education Board (SREB). Southern universities spend only 20 percent of the current research funds and employ only 20 percent of the Nation's scientists and engineers engaged in research and development, SREB says. Since the southern region has only 24 scientists and engineers per 100,000 population as compared to 42 per 100,000 in the rest of the Nation, SREB is calling for the training of more research persons for the South.

In New Jersey, local school districts with more than 25 teachers have been authorized by the State Board of Education to establish the position of school business administrator. Two or more districts with 25 or fewer teachers may establish the position jointly.

Senior Citizens Month

A proclamation by the President of the United States

WHEREAS, there are now more than 17 million persons aged 65 and over in our population, and this number is expected to increase to 24 million by 1980; and

WHEREAS, this large segment of our population represents a great national resource of skills, wisdom, and experience upon which much of our Nation's progress has been built and which continues to enrich our daily lives and to provide counsel and leadership; and

WHEREAS, all persons reaching their later years should have an opportunity to share fully in the benefits of our advances in economic wealth, science, technology, and culture; and

WHEREAS, all information and educational means should be used to foster an environment in which our senior citizens can gain this opportunity and can lead useful and satisfying lives, consistent with their capacities; and

WHEREAS, the Federal Government should provide leadership, encouragement, and assistance to the State, communities, and voluntary organizations in utilizing the potentials of our elder citizens:

NOW, THEREFORE, I, JOHN F. KENNEDY, President of the United States of America, do hereby designate the month of May 1963 as Senior Citizens Month, and urge all persons and public and private organizations to cooperate in its observance by—

Increasing community awareness of the problems faced by older men and women;

Strengthening services and opportunities so that older Americans may meet their special needs;

Giving recognition to their past and present contributions;

Making this special month not an end in itself but the beginning of continuing interest and activity on behalf of older people.

I also invite the Governors of the States, the Governor of the Commonwealth of Puerto Rico, the Commissioners of the District of Columbia, and appropriate officials in other areas in the jurisdiction of the United States to join in the observance of Senior Citizens Month.

IN WITNESS WHEREOF I have hereunto set my hand and caused the seal of the United States of America to be affixed.

Done at the city of Washington this 18th day of April in the year of our Lord nineteen hundred and sixty-three, and of the Independence of the United States of America the one hundred and eighty-seventh.

BONDS

for educational purposes

. . . sales, interest rates, et cetera . . .

Public schools

By ELMER C. DEERING, *specialist on the financing of school facilities, Division of Elementary and Secondary Education, Office of Education.*

BOND SALES for the public schools were off to a bad start in the first quarter of 1963, but in April sales reached nearly $300 million and substantially improved the record.

In the first quarter of 1963, school bond sales totaled only $630 million—a lag of $150 million, or 19 percent, behind sales in the corresponding period of 1962. (Sales of bonds for other muncipal purposes were doing better: they were only $125 million, or 8 percent, behind 1962, a record year.) The April sales, however, have reduced this year's lag in school bonds to about $100 million.

In the 7 months between October 1, 1962, and April 30, 1963, more than $1 billion of rated school bonds were sold, at an average net interest cost of 2.98 percent. In the nearly 4 years that the Office of Education has been reporting interest rates on school bonds according to ratings, the monthly average for all rated bonds has fallen below 3 percent only four times, all within the last 13 months and all appearing in this month's report.

Average net interest cost of Moody-rated bonds sold on primary market for public schools, by rating only: Annual 1959–60 to 1961–62; monthly, April 1962 to April 1963

Period	Aaa	Aa	A	Baa	Ba	All rated bonds
1959–60	3.26	3.63	3.77	4.21	4.55	3.84
1960–61	2.82	3.34	3.43	3.75	3.97	3.48
1961–62	2.84	3.23	3.19	3.52	3.93	3.27
1962						
April	2.56	2.84	2.85	3.35	3.61	2.94
May	2.56	2.95	3.03	3.34	3.80	3.13
June	2.82	2.83	3.14	3.48	3.93	3.21
July	.....	3.15	3.14	3.61	4.02	3.22
August	.....	3.02	3.08	3.43	3.82	3.17
September	2.83	2.80	3.08	3.47	3.75	3.10
October	.....	2.75	2.96	3.16	3.84	3.02
November	2.38	2.73	2.88	3.17	3.22	2.90
December	2.56	2.73	2.99	3.27	3.86	3.06
1963						
January	2.53	2.79	3.00	3.28	3.78	3.02
February	2.68	2.77	3.00	3.25	3.73	2.99
March	2.47	2.76	2.93	3.22	3.61	3.00
April	2.73	2.87	2.91	3.21	3.54	2.92

Average net interest cost of Moody-rated bonds sold on primary market for public schools, by rating and by term of bond, for the latest quarter and month available

Term of bond	Aaa	Aa	A	Baa	Ba	All rated bonds
	Latest quarter (January–March 1963)					
Under 15 years	2.25	2.38	2.58	2.78	3.10	2.54
15–24 years	2.64	2.82	2.99	3.21	3.53	2.96
25 years and over	.....	2.93	3.02	3.33	3.82	3.15
All terms	2.62	2.78	2.98	3.25	3.69	3.01
	Latest month (April 1963)					
Under 15 years	2.50	2.29	2.84	3.38	.....	2.61
15–24 years	2.79	2.85	2.91	3.15	3.54	2.91
25 years and over	.....	2.93	2.93	3.29	.....	2.97
All terms	2.73	2.87	2.91	3.21	3.54	2.92

Source: Sales reported by the Daily Bond Buyer; ratings, by Moody's Investors Service (rated bonds include 75–80 percent of all bonds for public school purposes).

THE LOW AVERAGE INTEREST COST of bonds sold in April 1963 is largely the result of the distribution of that month's sales among the ratings. Ordinarily, less than a third of the bonds are rated Aaa and Aa, but in April nearly half of them were. Two sales—one for $25 million rated Aaa and one for $50 million rated Aa—raised the averages for those two ratings but contributed substantially to a lower average for all bonds.

Colleges and universities

By W. ROBERT BOKELMAN, *chief, Business Administration Section, Division of Higher Education, Office of Education, and* ELMER C. DEERING.

APPROXIMATELY 35 percent of the 1.1 million students now housed in dormitories and apartments owned by colleges and universities in the United States are housed in facilities financed through the College Housing Program. In addition to these facilities, the program has financed 330 dining halls, 135 college unions, and several infirmaries.

The program began under the Housing Act of 1950, which provided for a fund of $300 million to be used as loans to colleges and universities for the financing of housing facilities. Since that time the Congress has authorized additional funds; as of now a total of almost

$2.9 billion has been authorized for lending through June 30, 1965. By December 31, 1962, nearly two-thirds of this amount—$1.9 billion—had been loaned or approved for loans under the program.

In the early days of the program, the list of facilities eligible for loans was restricted to housing accommodations used in connection with defense activities; but regulations have subsequently been relaxed to permit the financing of dormitories, student and faculty apartments, cafeterias, dining halls, student centers or college unions, and infirmaries, as well as housing accommodations for student nurses, interns, and resident physicians.

The requirement that borrowers advertise in the open market for bids on the bonds has resulted in substantial sales to investment bankers and other financial institutions. The investment banker seems to prefer short-term bonds; the College Housing Program buys most of the long-term bonds.

Interest rates under the program have ranged between 2.75 and 3.50 percent. Since 1955 the rates have been set each year at a figure not less than the average interest rate on all obligations forming a part of the Federal debt but not less than 2.75 percent; this rate is adjusted to the nearest one-eighth of 1 percent, plus one-quarter of 1 percent for administrative costs. Bonds purchased by the Community Facilities Administration as a result of projects approved and funds reserved during the fiscal year ending June 30, 1963, will bear a rate of 3.50 percent.

Administration of the College Housing Program is in the hands of the Community Facilities Administration of the Housing and Home Finance Agency. The Office of Education assists in the administration; it maintains a staff to report to HHFA on the educational eligibility of applicant institutions.

NINETY-SEVEN BOND SALES FOR INSTITUTIONS of higher education were reported by the *Daily Bond Buyer* for the first 3 months of 1963; they brought in a total of $164 million. The following list shows the sales month by month and institution by institution:

Issuing agency	Amount sold (000)	Term	Average net interest cost	Use of funds
JANUARY 1963				
PUBLIC				
Arkansas State Coll.	$624	1–16	3.41	student ctr
	2,000	17–39	[1] 3.38	student ctr
Univ. of Florida	500	1–39	[1] 3.50	residential
Univ. of Wichita	385	1–37	[1] 3.00	residential
Western Kentucky State Coll.	640	1–14	3.04	residential-dining
	2,617	15–39	[1] 3.37	residential-dining
Montana State Univ.	740	1–38	[1] 3.38	residential
	360	1–38	3.38	residential
New York City	$1,000	1–30	2.94	multipurpose
Bowling Green State Univ.	5,500	1–39	3.58	residential
Oklahoma State Univ.	4,580	1–21	3.23	student ctr
Southwest Texas State Coll.	175	1–14	3.14	residential
	665	15–39	[1] 3.38	residential
Central Washington State Coll.	550	1–38	[1] 3.13	residential
	2,774	1–38	[1] 3.50	residential
Univ. of Washington	380	1–18	3.15	residential
	820	19–38	[1] 3.50	residential
PRIVATE				
Catholic Univ. of America	1,500	1–38	[1] 3.50	residential-dining
George Washington Univ.	1,550	1–39	[1] 3.50	residential
Greenville Coll.	600	1–38	[1] 3.50	student ctr residential
Lincoln Coll.	275	1–37	[1] 3.50	residential
Anderson Coll.	500	1–28	[1] 3.38	student ctr
Bethel Coll. (Kans.)	500	1–37	[1] 3.50	residential
Nasson Coll.	350	1–38	[1] 3.50	residential
Clarkson Coll. of Technology	875	1–38	[1] 3.50	residential
Augustana Coll. (S. Dak.)	835	1–38	[1] 3.50	residential
Trinity Coll. (Vt.)	575	1–38	[1] 3.50	residential
FEBRUARY 1963				
PUBLIC				
Univ. of Georgia Bldg. Auth.	$1,602	1–25	3.01	residential
	1,936	26–40	[1] 3.38	residential
Univ. of Hawaii	640	1–37	[1] 2.88	residential
Univ. of Idaho	310	1–10	2.91	student ctr
	565	11–19	3.38	student ctr
	775	20–38	[1] 3.50	student ctr
Ball State Teachers Coll.	750	1–20	2.98	instructional
Kansas State Coll. of Pittsburg	140	1–8	2.75	student ctr
	240	9–18	3.30	student ctr
	334	19–28	[1] 3.50	student ctr
Eastern Kentucky State Coll.	386	1–10	2.90	residential
	295	11–14	3.19	residential
	2,506	15–39	[1] 3.38	residential
Rutgers—The State Univ.	535	1–13	2.90	residential
	640	1–13	2.89	res.-dining
New York Dormitory Auth.	3,745	14–38	[1] 3.13	residential
Univ. of North Dakota	5,500	1–31	3.32	residential
Glenville State Coll.	1,080	1–38	[1] 3.50	residential
	350	1–15	3.15	student ctr
PRIVATE				
Stanford Univ.	750	1–39	[1] 3.50	student ctr
Whittier Coll.	600	1–39	[1] 3.50	residential
Brandeis Univ.	2,335	1–38	[1] 3.50	res.-dining
Dean Junior Coll.	1,304	1–38	[1] 3.50	residential
Massachusetts Inst. of Technology.	3,000	1–38	[1] 3.50	residential
Elizabeth Seton Coll.	1,480	1–38	[1] 3.38	residential
St. Bernardine of Siena Coll.	768	1–38	[1] 3.50	residential
Bluffton Coll.	510	1–38	[1] 3.50	residential
Ohio Wesleyan Univ.	1,900	1–38	[1] 3.50	res.-dining
Windham Coll.	330	1–37	[1] 3.13	residential
Mary Baldwin Coll.	980	1–49	[1] 3.38	residential
Gonzaga Univ.	570	1–38	[1] 3.38	res.-dining
	1,405	1–38	[1] 3.50	res.-dining
Wheeling Coll.	750	1–38	[1] 3.50	res.-dining
MARCH 1963				
PUBLIC				
Univ. of Alaska	$2,650	1–20	3.34	instructional
Univ. of Colorado	[2] 5,900	1–39	[1] 3.38	residential
Eastern Illinois Univ.	2,400	1–39	3.52	residential
State of Illinois	50,000	1–25	2.88	multipurpose
Indiana State Coll.	1,650	1–29	3.49	res.-dining
	1,000	1–29	3.34	res.-dining
	480	30–37	[1] 3.38	res.-dining
Univ. of Louisville	2,997	1–38	3.38	residential
Univ. of Maine	2,000	1–40	3.09	instructional
Central Michigan Univ.	250	1–14	3.37	residential
	925	15–39	[1] 3.38	residential
Univ. of Michigan	750	1–27	3.38	residential
	500	28–39	[1] 3.50	residential
Alcorn A&M Coll.	[3] 560	1–38	[1] 3.50	residential
Jackson State Coll.	790	1–39	[1] 3.50	residential
Fashion Inst. of Technology	1,970	1–37	[1] 3.13	residential
Oklahoma State Univ.	130	1–8	3.61	student ctr
	40	9–10	3.03	student ctr
	125	11–15	3.17	student ctr
	150	16–20	3.32	student ctr
	935	21–40	[1] 3.38	student ctr
State of Rhode Island	2,000	1–30	3.09	multipurpose

See footnotes at end of table.

Issuing agency	Amount sold (000)	Term	Average net interest cost	Use of funds
PRIVATE	MARCH 1963			
California Western Univ	$1,123	1-38	[1] 3.50	res.-dining
Illinois Wesleyan Univ	625	1-39	[1] 3.50	residential
Northwestern Coll	325	1-39	[1] 3.38	residential
Kansas Wesleyan Univ	650	1-39	[1] 3.38	residential
McPherson Coll	575	1-39	[1] 3.38	residential
Madonna Coll	[2] 900	1-49	[1] 3.50	res.-dining
Missouri Valley Coll	402	1-38	[1] 3.50	residential
Alfred Univ	1,395	1-38	[1] 3.50	res.-dining
Univ. of Rochester	3,240	1-37	[1] 3.50	residential
Hiram Coll	325	1-39	[1] 3.38	residential
Coll. of Steubenville	[2] 650	1-39	[1] 3.38	res.-dining
George Fox Coll	594	1-38	[1] 3.50	residential
Duquesne Univ	2,100	1-31	[1] 3.50	res.-dining
	1,300	32-38	[1] 3.38	res.-dining
Muhlenberg Coll	1,000	1-49	[1] 3.13	student ctr

[1] Purchased by Community Facilities Administration, HHFA.
[2] HHFA bid.

The foregoing sales are summarized by the following table.

Bonds sold for higher education: Number and amount of sales and average net interest cost, by type of institutional control and by type of financing, type of bond, and type of facility to be constructed, January 1 to March 31, 1963

Type of financing, type of bond, and type of facility	Number of sales	Bonds sold: Amount (thousands)	Bonds sold: Percent of amount of all sales	Average net interest cost
	Publicly controlled institutions			
Type of financing:				
HHFA	24	$34,127	27.3	3.34
Other	34	90,714	72.7	3.06
Type of bond:				
Revenue	53	67,191	53.8	3.33
General obligation	5	57,650	46.2	2.91
Type of facility:				
Academic:				
Instructional	3	5,400	4.3	3.19
Multipurpose [1]	3	53,000	42.5	2.89
All academic	6	58,400	46.8	2.91
Auxiliary:				
Residential	31	48,116	38.5	3.35
Residential-dining	6	7,027	5.6	3.32
Student center	15	11,298	9.1	3.29
Student center-residential				
All auxiliary	52	66,441	53.2	3.34
All sales	58	124,841	100.0	3.14

Bonds sold for higher education—Continued

Type of financing, type of bond, and type of facility	Number of sales	Bonds sold: Amount (thousands)	Bonds sold: Percent of amount of all sales	Average net interest cost
	Privately controlled institutions			
Type of financing:				
HHFA	39	$39,446	100.0	3.46
Other				
Type of bond:				
Revenue	39	39,446	100.0	3.46
General obligation				
Type of facility				
Academic				
Auxiliary:				
Residential	23	20,668	52.4	3.47
Residential-dining	12	15,928	40.4	3.48
Student center	3	2,250	5.7	3.31
Student center-residential	1	600	1.5	3.50
All auxiliary	39	39,446	100.0	3.46
All sales	39	39,446	100.0	3.46
	All institutions			
Type of financing:				
HHFA	63	$73,573	44.8	3.27
Other	34	90,714	55.2	3.06
Type of bond:				
Revenue	92	106,637	64.9	3.38
General obligation	5	57,650	35.1	2.91
Type of facility:				
Academic:				
Instructional	3	5,400	3.3	3.19
Multipurpose [1]	3	53,000	32.2	2.89
All academic	6	58,400	35.5	2.91
Auxiliary:				
Residential	54	68,784	41.9	3.39
Residential-dining	18	22,955	14.0	3.43
Student center	18	13,548	8.2	3.29
Student center-residential	1	600	.4	3.50
All auxiliary	91	105,887	64.5	3.38
All sales	97	164,287	100.0	3.22

[1] The term "multipurpose" here designates buildings to be constructed from the proceeds of bond sales made to finance more than one academic building.

44 countries call

THIS SUMMER the Peace Corps will train 4,000 volunteers for positions in 44 countries which have requested assistance. Many of the requests are for teachers, at all levels of education and in many fields. The Corps is recruiting now. For information about these and other opportunities, write to the Peace Corps, Washington 25, D.C.

Among the 4,000 volunteers the Corps will train this summer more than half will be educators for these countries:

Activity	*Country*	*Number of volunteers*	*Training begins*
EDUCATION			
Elementary	Ethiopia	200	July
	Liberia	50	June
	Malaya	15	July
	North Borneo/Sarawak	11	July
	Philippines	300	June
	Thailand	19	July
Secondary:			
English language	Ghana	23	June
	Liberia	15	June
	Nigeria	26	June
	Sierra Leone	10	June
	Malaya	3	July
	Thailand	50	July
	Peru	30	July
	Turkey	75	June
Grammar and literature	Cameroons	30	July
	Gabon	40	July
	Ivory Coast	15	June
	Morocco	40	June
	Senegal	30	June
	Tunisia	30	June
French	Ghana	23	June
	Nigeria	20	June
	Sierra Leone	5	June
Latin	Nigeria	3	June
	Sierra Leone	1	June
Mathematics	Ethiopia	10	July
	Ghana	12	June
	Liberia	10	June
	Nigeria	27	June
	Sierra Leone	15	June
	Malaya	4	July
	Philippines	45	June
	Turkey	22	June
	India	7	June
Science	Ethiopia	10	July
	Liberia	35	June
	Nigeria	27	June
	Sierra Leone	20	June
	Malaya	4	July
	Turkey	22	June
	India	7	June
Biology	Ethiopia	5	July
	Ghana	20	June
	Nigeria	35	June
	Sierra Leone	2	June
Chemistry	Ethiopia	5	July
	Ghana	10	June
	Nigeria	32	June
	Sierra Leone	2	June
Physics	Ethiopia	5	July
	Ghana	12	June
	Nigeria	49	June
	Sierra Leone	2	June
Sociology	Liberia	10	June
Physical education	Ethiopia	2	July
	Morocco	30	June
	Sierra Leone	5	June
	Malaya	5	July
	India	3	June
	Venezuela	40	July
	Ecuador	50	August
History	Ghana	10	June
	Sierra Leone	5	June
Geography	Ghana	3	June
	Nigeria	21	June
	Sierra Leone	5	June
	Malaya	1	July
Art	Sierra Leone	1	June
Music	Nigeria	5	June
	Sierra Leone	2	June
Business administration	Gabon	5	July
Commercial education	Gabon	25	July
	Nigeria	12	June
	Sierra Leone	5	June
	Ethiopia	10	June
	Pakistan	3	July
Economics	Pakistan	5	July
Home economics	Nigeria	2	June
	Pakistan	3	July
Industrial arts	Pakistan	5	July
Vocational education (woodworking, carpentry, electricity, masonry, television refrigeration repair, plumbing, plastics, and other industrial arts)	Thailand	6	July
	Honduras	6	July
	Pakistan	5	July
	Ethiopia	6	July
	Nigeria	30	June
	Somali	5	July
	Ecuador	50	July
	Iran	17	June
	Turkey	3	June
	Malaya	11	June
	St. Lucia	5	June
	Dominica	4	June
University education:			
English language	Ethiopia	4	July
	Nigeria	10	June
	Philippines	20	June
	Chile	30	July
French	Nigeria	4	June
Mathematics	Ethiopia	3	July
	Nigeria	4	June
	Bolivia	1	July
Science	Ethiopia	3	July
	Philippines	20	June
Chemistry	Nigeria	2	June
Physics	Nigeria	3	June
	Bolivia	1	July
Zoology	Nigeria	2	June
Teacher education,	Nigeria	5	June
	Thailand	9	July
	Honduras	50	July
Adult education	Brazil	25	July
History	Ethiopia	22	July
Art	Ethiopia	1	June
Commercial education	Nigeria	2	June
Economics	Nigeria	2	June

In addition, there will be opportunities in many of these countries for agricultural specialists, home economics specialists, foresters, registered nurses, physicians, lawyers, civil engineers, geologists, social workers, and public works specialists.

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